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CLASSIFICATION OF THE FOSSORIAL, PREDACEOUS AND PARASITIC WASPS, OR THE SUPERFAMILY VESPOIDEA.

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(Paper No. 6.—Continued from p. 137.)

FAMILY XXVIII.—Vespidæ.

This family is restricted to the paper-making wasps, all social species living in large communities and having three distinct sexes, female, worker, and male, thus agreeing with the social bees, the *Apidæ* and *Bombidæ*, and with many ants, *Dorylidæ*, *Myrmicidæ*, *Formicidæ*, etc.

In some species, too, like the ants, there appear to be two forms of the worker.

Deceived by their habits, for structurally they are widely separated, Westwood and Packard thought the social wasps were allied to the *Apidæ*, and in their scheme of classification have placed them next to the bees, with which they have nothing in common.

Cresson, Kirby and most late writers seem to have followed them, but in my opinion it is clearly an unnatural position; they have no relationship whatever with the bees, and are a component of this great complex, but with affinities, through some exotic forms, allying them with the next great complex, or the superfamily FORMICOIDEA.

Two very distinct groups, here called subfamilies, have been recognized. They were first correctly indicated by C. G. Thomson, the distinguished Swedish entomologist, who called them tribes.

Table of Subfamilies.

Hind wings entire, <i>without</i> an anal lobe, mesepisterna not separated	Subfamily I.—Vespinæ.
Hind wings <i>with</i> a distinct anal lobe; mesepisterna separated.....	Subfamily II.—Polistinæ.

SUBFAMILY I.—Vespinae.

1874. Vespina, Tribus. Thomson, Skand. Hym., III., p. 6.

The absence of an anal lobe in the hind wings, and the non-separated mesepisternum, distinguish the group. The species, too, are much shorter, more robust, with a decidedly shorter mesonotum.

Paravespa, Radoszkowsky, described in 1886, I do not know, but have incorporated it from the description alone.

Three genera have been recognized, separable as follows:

Table of Genera.

First abdominal segment broadly truncate at base.

Eyes not extending to the base of the mandibles.....2.

Eyes extending to the base of the mandibles, or very nearly.

Third cubital cell along the radius fully as long as along the cubitus.....*Vespa*, Linné.

(Type *V. vulgaris*, Linné.)

Third cubital cell along the radius much shorter than along the cubitus*Paravespa*, Radoszkowsky.

(Type *P. Komarowii*, Radoszk.)

2. Third submarginal cell along the radius longer than along the cubitus, or about twice as long; clypeus longer than wide, sinuate or slightly emarginate anteriorly and semicircularly emarginate at sides anteriorly.....*Vespula*, Thomson.

(Type *Vespa austriaca*, Panzer.)

SUBFAMILY II.—Polistinae.

1874. Polistina, Tribus. Thomson, Skand. Hym., III., p. 6.

In this subfamily the hind wings have an anal lobe, and the mesepisternum is separated.

The genera are numerous, and have reached their greatest development in tropical countries. The group is of great economic importance, as the various genera destroy the more destructive Lepidopterous larvae.

Table of Genera.

Second cubital cell receiving both recurrent nervures.....2.

Second and third cubital cells each receiving a recurrent nervure.

Second cubital cell petiolate; clypeus terminating in a tooth; mandibles short, acutely dentate at apex *Anthreneida*, White.

(Type *Vespa Sumatræ*, Weber.)

2. Abdomen petiolate ; mandibles 2-4-dentate ; maxillary palpi 5- or 6-jointed.....4.
Abdomen not petiolate.
Abdomen subsessile, the first segment campanulate.....3.
Abdomen sessile, the first segment very small, rounded above, the second very large, occupying most of the surface, the following being more or less retracted ; second cubital cell wider than long ; scutellum entirely covering the post-scutellum.....Nectarinia, Shuckard.
(Type *Brachygastra analis*, Perty.)
3. Metathorax smooth or punctate ; abdomen rather short, subovate or oval.....Chartergus, Latreille.
(Type *Vespa apicalis*, Fabr.)
Metathorax transversely striate or aciculate ; abdomen long, fusiform, or elongate ovate.....Polistes, Latreille.
(Type *Vespa biglumis*, Linné.)
4. Front wings with *three* cubital cells5.
Front wings with *two* cubital cells.....Paraicaria, Gribodo.
(Type *P. bicolor*, Gribodo.)
5. Abdomen with the first segment, or petiole, linear, the second segment more or less constricted or petiolate at base.....7.
Abdomen with the first segment, or petiole, clavate or subglobose at apex, the second segment normal, not constricted at base.
Second abdominal segment not especially large, not occupying most of the surface nor covering the third6.
Second abdominal segment very large, occupying most of the surface, and covering the third, the terminal segments more or less retracted ; mandibles 4-dentate, the inner tooth the smallest ; clypeus wider than long, slightly rounded or subtriangular anteriorly, but not dentate.....Icaria, Saussure.
(Type *I. artifex*, Sauss.)
6. First abdominal segment subcampanulate ; body of abdomen conical ; prothorax narrowed, not margined above ; temples as broad or a little broader than the width of the eyes.....Synæca, Saussure.
(Type *Vespa Surinama*, Linné.)
First abdominal segment variable, sublinear or clavate ; body of abdomen fusiform, clavate or subovate ; prothorax short ; temples

- scarcely so broad as the width of the eyes; mandibles 4-dentate, the teeth subequal; clypeus angulate anteriorly. . . Polybia, Lepeletier.
(Type *Polistes liliacea*, Fab.)
7. Body elongate, cylindrical, or fusiform, the abdominal petiole very long; mandibles 3- or 4-dentate. 8.
Body rather short, not elongate, the abdominal petiole not especially long; mandibles bidentate.
Body of abdomen rotund; eyes small, the malar space distinct. Gyrostoma, Kirby.
(Type *Cyclostoma orientalis*, Kirby.)
Body of abdomen short-ovate; eyes large, the malar space very small or linear. Tatua Saussure.
(Type *Vespa morio*, Fabr.)
8. Body of abdomen fusiform, the second segment pedicellate. 9.
Body of abdomen elongate, cylindrical or nearly, the second segment not pedicellate and scarcely longer than the third. . . Apoica, Lepeletier.
(Type *Polistes virginea*, Fabr.)
9. Second cubital cell trapezoidal, narrowed above; mandibles 4-dentate.
Clypeus short, angulate anteriorly; maxillary palpi 5-jointed. Belonogaster, Saussure.
(Type *Vespa grisea*, Fabr.)
Clypeus anteriorly slightly emarginate and bidentate; maxillary palpi 6-jointed, the last joint the longest. Mischocyttarus, Saussure.
(Type *Zethus labiatus*, Fabr.)
Second cubital cell triangular; mandibles 3-dentate; clypeus wider than long, subemarginate at apex; maxillary palpi 6-jointed, the first joint elongate, the last two small. Paramischocyttarus, Magretti.
(Type *P. subtilis*, Magretti.)

ERRATA.

In Mr. G. B. King's paper on the "Coccidæ of British North America," in the June number, the following corrections should be made :
Page 159, for *Ripersia basi* read *R. lasii*.
Page 160, for *Pulvinaria brassicæ* read *P. brassicæ*.
Page 160, *Aspidiotus Dearnessi*, Ontario (London), is from Lake Huron, not London.

MR. GROTE'S CRITICISMS.

BY HENRY H. LYMAN, MONTREAL.

As Mr. Grote has done me the honour to make certain criticisms on some of my recent papers, I would ask space for a brief reply.

In regard to *Gortyna Aërata*, I have no doubt that it has an alternative food-plant, but possibly it may never be discovered. Mr. Bird has made the same point, that as burdock is an introduced species it could not be the original preferred food-plant of any American species. But, while I admit that an introduced species could not be the original food-plant of an American insect, I see no reason why it should not be the preferred food since its introduction, just as *Doryphora Decemlineata* prefers the potato to its original food-plant.

If the difference between *Nitela* and *Aërata* was not made sufficiently apparent in my description, it was because I never thought of the two being confused, as the difference in colour is so marked, while Dr. Dyar had, as stated, expressed the opinion that my specimen was only a variety of *Necopina*, and Mr. Bird, to whom I also showed it, never suggested any close relationship to *Nitela*, but said that if the larva proved to be distinct from that of *Necopina* I would be warranted in describing it as a new species, and I am quite sure that had I not bred the species no one would have believed that a flown specimen of it was anything but an example of *Necopina*.

In regard to the names *Nitela* and *Nebbris*, I must confess that I was a little amused at being chided as too strict a stickler for the rigid enforcement of the law of priority, especially in view of the fact that I have already expressed the opinion that the law of priority should not be maintained in favour of the variety as against the prevailing form of the species*, but if I am going to extremes in carrying this law back two inches, and that is all the priority I claim for the name *Nebbris*, what should be thought of Mr. Grote in carrying it back to primeval times, long before there was any entomologist to criticise his fellows, to say nothing of studying these creatures.

If, as conjectured by Mr. Grote, the form *Nitela* was the primitive form, and the form *Nebbris* is a more specialized form which has been evolved from it, it would seem probable that in course of time the latter would become the dominant one, in spite of the varietal name which Mr.

*CAN. ENT., XXIX., 256.

Grote wishes to keep tied to it. Not only so, but if the tendencies which produced this form continued, the form *Nitela* might become extinct, and yet *Nebris* would only be var. *Nebris* of the extinct *Nitela*.

Surely we must classify species as we find them existing at present, and not on the basis of any man's conjecture of what they may have been hundreds of thousands of years ago. If the law of priority is to be carried back to primeval times, it will be invested with new terrors.

In regard to my remarks on *Lophodonta Angulosa* and *Lophodonta Georgica*, or, as Dr. Packard in his work on the Bombycine Moths gives them, *Lophodonta Angulosa* and *Drymonia Georgica*, I confess that I had overlooked the paper by Messrs. Grote and Robinson in the Annals of the N. Y. Lyceum N. Hist.

Of course, theoretically, anyone who ventures to write on any entomological subject is supposed to be acquainted with everything which has ever been published on that subject in his own country, and in every other country, but practically if we attempted to follow that rule, I am afraid that little, if anything, would be written. We have to take some chances, and a man away from large entomological libraries must depend to a certain extent upon catalogues and indexes, and in no record or catalogue which I possess is this paper referred to.

I am much obliged to Mr. Grote for calling my attention to it, and may point out that the authors fell into the error of giving the number of Abbot & Smith's plate as 78 instead of 83, as given by me.

I disagree with those gentlemen, however, in their conclusions, as there is not a particle of evidence pointing to the probability of the "lower right-hand figure" of Abbot's plate being a male. It was figured as a female, and presumably belonged to that sex. It is, of course, possible that Abbot may have been mistaken, and it may have been a male, just as he figured a small female of *Phobetron Pithecium* as the male of that species, a not very heinous error when the extremely aberrant character of the male is considered, but even if it was a male, I fail to see that that would make any difference. The upper left-hand figure was the one described as the typical form, it being distinctly stated that the males and the majority of the females were of that type, while the lower right-hand figure was given merely as a variety of colour.

Mr. Grote says that Abbot & Smith's name became restricted to this supposed "variety of colour" by Herrick-Schaffer's description of *Georgica*, but he did not describe it; he merely published a figure, a

much better one, it is true, than Abbot's, and put down the name in the various lists given in the work, thus :

Page 11. *Notodonta Georgica*—*angulosa*, Abbot.

Page 66. *Notodonta* O.

angulosa Abbot — *georgica*, H.-S., fig. 384 — *Georg. Am.*

Page 82. No. 384, *Notodonta georgica*, H.-S., foem.—*Notodonta angulosa*, Abbot.

So far as I have been able to make out, it was merely a substitution of the name *Georgica* by Herrick-Schaffer for the name *Angulosa* proposed by Sir J. E. Smith, in much the same way as the latter tried to substitute the name *Sphinx Chionanthi*, A. & S., for *Sphinx Rustica*, Fabr., and I hold that if he recognized that Abbot had figured two species on that plate, he should have given his new name to the species represented by the lower right-hand figure.

A NEW SPECIES OF MELANOPLUS FROM ARIZONA.

BY A. N. CAUDELL, WASHINGTON, D. C.

Melanoplus Brownii, sp. nov.—General colour brownish fuscous. Head slightly prominent, with the occiput elevated a little above the pronotum and with a black postocular stripe; interspace between the eyes no broader than the basal segment of the antennæ; fastigium moderately declivent and deeply sulcate, especially in the male; frontal costa percurrent and deeply sulcate except above, where it is biserially punctate. Eyes large and somewhat prominent, distinctly longer than the infraocular portion of the genæ. Antennæ long, in the male as long or longer than the posterior femora. Pronotum equal in the anterior portion, but quite noticeably expanding on the metazona, truncate anteriorly, posteriorly obtuse angulate, the angle rounded; lateral lobes marked with a more or less interrupted black stripe which is continuous with the postocular stripe of the head. Median carina distinct only on the metazona, which is shorter than the prozona. Prosternal spine suberect, pyramidal, apically acuminate. Interspace between the mesosternal lobes longer than broad; metasternal lobes subattinent. Elytra long and slender, extending far beyond the hind femora in both sexes, almost

immaculate. Hind femora moderately slender, uniformly brownish, often darker above and externally and sometimes with slight fuscous genicular markings. Hind tibiae yellowish brown, the spines tipped with black, ten to eleven in the outer series. Extremity of male abdomen neither swollen nor upturned. Furcula broad as in the other members of the group to which this species belongs; cerci shaped very much the same as those of *M. Bowditchi*, somewhat incurved and externally sulcate at the tip, sometimes very inconspicuously so. Subgenital plate long, apically narrow.

Length: elytra, male 18.5 to 19.5 mm., female 23 to 24 mm.; hind femora, male 10.5 to 11 mm., female 13 to 14 mm.

Three males, three females, Yuma, Arizona.

Type No. 6302, U. S. Nat. Mus.

These specimens were sent to the Department of Agriculture by the collector, Mr. Herbert Brown, superintendent of the territorial prison at Yuma, Arizona. They were collected on December 8th, 1901, a few miles from Yuma, up the Colorado River, at the head of a dry slough. They belong to the *Bowditchi* series, and the species is most nearly allied to *M. pictus*, from which it is readily distinguished, however, by the differently-shaped cerci and the smaller size.

ACKNOWLEDGMENTS.

On the 26th of May, 1902, I received from Mr. C. G. Anderson, London, a freshly-emerged specimen of *Papilio Ajax* (spring form, *Telamonides*, Feld.), taken by him at Kingsville on the 24th—another testimony to the southern character of the flora and fauna of Lake Erie's northern shore.

I desire to give expression to my pleasure in receiving from Mr. J. A. Morden, London, Ont., twenty-four specimens of that rarely-observed beetle, *Cyllene pictus*, Drury, which he secured for me out of a stick of bitter-nut hickory in the first week of May, 1902.

J. ALSTON MOFFAT.

NEW GENERA AND SPECIES OF ACARIANS.

BY NATHAN BANKS, EAST END, VA.

In the following pages I have included descriptions of a few new genera and species of mites that have been in my possession for some time. Several of the genera are for the first time recorded in America. A note is added on two species of *Trichotarsus*. Of the two new genera, the *Liroaspis* is a very remarkable form, and finds its nearest allies in certain tropical species.

Trombidium granulatum, n. sp.—Bright blood red, the legs are clothed with scale-like hairs, those on the basal joints are white, elsewhere they are red, except on the apical joint of leg I, which is mostly white; the palpi and mouth-parts are mostly white, but reddish toward the tip. The body is covered above with rounded elevated granules, subequal in size and height; on the under side they are more scarce and there are some short red hairs. The body is hardly twice as long as broad, broadest at humeri, slightly constricted over base of the third legs, and broadly rounded behind; the dorsal outline at juncture of head and abdomen shows very little depression; on the cephalic part there is a median groove, and each side are two sessile eyes. The legs are short and stout, the last joint of leg I. is somewhat swollen, and plainly longer than the preceding joint; on the median joints of legs I. and II. there are above smooth stripes, where there are few hairs. The hind legs reach considerably beyond end of abdomen, the last joint is not swollen and is about equal to the penultimate. The genital opening is circular, and pale; the anal opening is elongate. The palpi are short, the second joint much swollen; the thumb is clavate, and barely passes the stout claw. Length, 1.8 mm.

A few specimens from Ft. Lee, New Jersey. This species, by its granular covering, is closely allied to the European *T. sanguineum*, Koch. In that species, however, the thumb of palpus is not clavate, but pointed, the last joint of leg I. is more swollen, the hind legs are rather shorter, and the bases of the legs are not pale in colour.

Ammonia Americana, n. sp. (Fig. 5).—Rather brownish yellow, with a red mark each side (in alcohol these are lost), and a reddish stripe behind, legs and palpi paler. The mandibles are short, less than the length of the cephalothorax, with two bristles each side; palpi short, second joint about three times as long as broad, third indistinctly separated from the second, about as long as broad, fourth scarcely longer

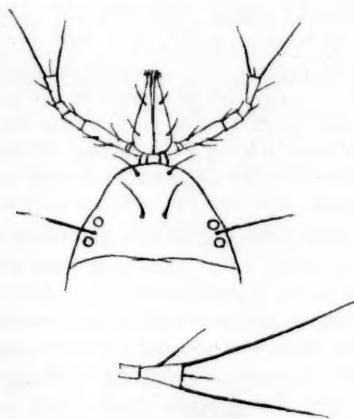


FIG. 5.

than broad, fifth about one and one-half times as long as broad at tip, with two long hairs at tip, the outer one more than twice as long as joint; body almost twice as long as broad, sides (beyond eyes) sub-parallel, broadly rounded behind; two eyes each side, and near them a long seta; two setae in front and two on middle of the cephalothorax; on anterior margin of the cephalothorax is a single black quadrangular mark with a white circle in it. Length, .75 mm. Washington, D. C. (March.)

Specimens were taken on wet ground under stones and among short grass; it is the first species of the genus that I have seen from America.

Notophallus dorsalis, n. sp.—Black; legs red; a large elongate red spot on the posterior median dorsum, containing the anal opening; a large eye each side on the anterior portion; some scattered short hairs above. Legs short, first pair scarcely longer than the body, fourth pair shorter than the body. Genital opening large, elliptical, divided longitudinally; palpi short, red. Length, .8 mm.

A few specimens taken at Washington, D. C., in the early spring; on ground under stones and sticks. It is the first record of the genus in this country; a genus differing from all our other Eupodidae in having the anal opening on the dorsum.

Cheyletus clavispinus, n. sp.—Body pale reddish or yellowish, fading out in alcohol. Body somewhat quadrangular, corners rounded, about

one-fourth longer than broad; above on each side with two rows of about seven or eight long clavate and finely serrate bristles, one row is lateral, and one submedian; at the tip there are two long bristles and two shorter intermediate ones; the palpi are short and stout, outwardly geniculate, bearing above two prominent clavate hairs, last joint with a slender curved claw and with the usual serrate organ; first legs as long as body, tarsus slender, tipped with two hairs longer than the joint itself, penultimate joint with two clavate hairs above and two moderately long simple hairs at the tip; a few clavate hairs on the other joints; other legs with a few clavate hairs on the joints except the tarsi; fourth legs about as long as the body; venter with a few scattered simple hairs. Length, .6 mm.

Specimens were received from Dr. Blatchley, who took them from beneath the wings of an *Aradus* found near Indianapolis, Indiana. A European species has also been recorded as found on *Aradus*; but it is different from ours.

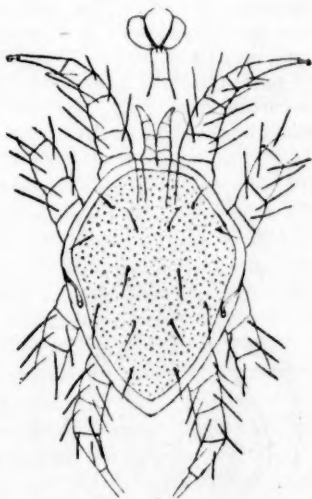


FIG. 6.

Pteroptus Americanus, n. sp. (Fig. 6).—Pale yellowish. Body about one and one-half times as long as broad; truncate in front, broadest just behind the second pair of legs, thence tapering to an almost acute tip; shield nearly as large as the dorsum, leaving a narrow margin all around, broader on the sides than in front; peritreme situate over the third coxae,

arcuate; dorsal shield plainly granulate, and provided with a few scattered, short hairs; legs short and heavy, with rather long tarsi, terminating in the usual two claws and swollen pad, the basal joints with a number of stout bristles, most of them longer than the diameter of the joints. Palpi quite long, divergent. On the front of the body are seen four parallel lines, reaching back a short distance. Length, 1 mm.

From a bat in a cave in Indiana (Blatchley). Nearest to *P. euryalis* of Europe, but with a longer body, more granulate shield, and more slender tarsi. The truncate anterior margin is also peculiar. This is, I believe, the first time the genus has been recorded from this country.

Liroaspis, n. gen.—A Gamasid, probably related to *Lercon*. The genital opening is in front of sternal plate; the dorsal shield is divided into six pieces, a large piece in front, a smaller piece near tip, and four small median pieces arranged in a quadrangle. The claws are all very weak, especially so in the front legs. The peritreme runs along above the coxæ for a considerable distance. The body is broad, and rather flat; behind emarginate and tipped with four spine-like bristles. The anal opening is small and near tip of body. Type *L. Americana*, n. sp.

I also refer to this genus the *Seius acanthurus*, Can., described from Australia, and also recorded from Italy. Berlese puts it in *Lercon*, which, however, is distinct by the short peritreme, etc.

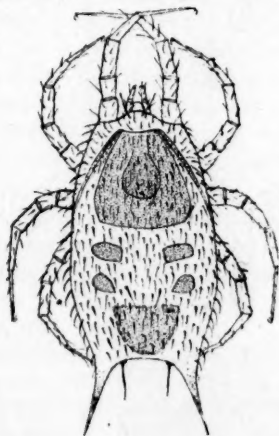


FIG. 7.

Liroaspis Americana, n. sp. (Fig. 7).—Yellowish throughout. Body a little more than one and one-half times as long as broad, about as broad

in front as behind, broadest in middle, sides evenly convex, each posterior angle prolonged into a spinelike process tipped with a long stout bristle. They are slightly divergent, and between them are two long stout bristles arising from the hind edge of the body. The anterior margin of the body is rounded, and prominent in the middle, and bears two submedian bristles. The dorsal surface of the body is scantily clothed with short curved bristles, and there is a row of bristles along each side-margin. There are six shields on the dorsum; in front is a large trapezoidal piece containing a paler central figure, from the anterior angle of this trapezoid a curved line extends backward and reaches the side-margin before the middle. Behind this large piece are four submedian pieces, the anterior pair longer than the posterior pair, and fully their diameter apart. Behind there is a median semicircular piece, the convexity behind. The legs are all shorter than the body and with many bristles. Length, 1.5 mm.

Specimens from Olympia, Washington, and from St. Croix Falls, Wisconsin. A remarkable and interesting species, evidently confined to northern localities.

Hoplodermis granulata, n. sp.—Pale yellowish brown. Dorsum as high as broad, evenly convex above; about one and two-thirds times as long as broad, broadly rounded in front and behind, broadest in middle, its surface quite coarsely but evenly granulate, and provided with about twenty erect bristles, mostly situate around the margin, nearly all rather thick and blunt-pointed. Cephalothorax about once and one-third longer than broad, broadly rounded in front, finely granulate and with two long superior bristles. Ventral openings subequal in size, each about as broad as long; the anal one slightly indented behind; setæ quite long arcuate. Length, .6 mm.

Three specimens from Ottawa, Canada (Harrington). Distinct by elongate form and granulate dorsum.

Gymnobates, n. gen.—Tarsi with three equal claws; abdomen provided with wings, with an extension forward over the basal part of the cephalothorax. Tarsi broad at tips. Setæ short, capitate. The coxæ marginal. Sternum divided by two transverse lines. Ventral openings far apart. Type *G. glaber*.

Differs from *Oribates* in the tarsi being broad at tip, and the abdomen extending over the cephalothorax.

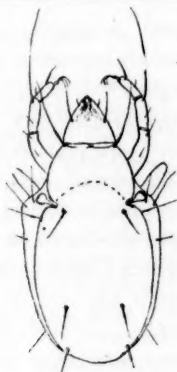


FIG. 8.

Gymnobates glaber, n. sp. (Fig. 8).—Pale yellowish brown. Cephalothorax smooth; about twice as long as broad, tapering in front, its basal half covered by an extension of the dorsum of abdomen; from each anterior corner of this extension is a long, stout bristle; on the cephalothorax toward tip is a bristle each side. Abdomen smooth; exclusive of wings, it is about one and three-fourths times as long as broad, broadly rounded behind; with six bristles above, two at base, two toward tip, and two on hind margin. On each side of dorsum is a slender wing, broadest in front, with four or five bristles above, three of them in front. Setæ short, capitate. Legs rather short, the second pair largest, joints sub-fusiform, tarsi broad at tip, the tibia with a long hair at tip above. A lamella behind coxa I. Genital opening nearly circular, nearly twice its diameter from the much larger anal opening, the latter sub-elliptical and emarginate in front. Length, .45 mm.

One specimen taken from a dry gall, at Washington, D. C.

Trichotarsus osmiæ, Dufour.—I have taken specimens of a species of *Trichotarsus* from a species of *Osmia*, at Sea Cliff, N. Y., which appears to agree in all particulars with this European species. It is, of course, possible that when the adult females of these forms are known, they may present differences. This species differs from the more common *T. xylocopæ* in having two claws at tips of tarsi I., II. and III.

Trichotarsus xylocopæ, Dufour.—Prof. H. Osborn has recorded this species as taken from a Californian *Xylocopa*, and sent him by Mr. Coquillett. It is a common European species.

ON THE GENUS *LECANIUM*.

BY MRS. C. H. FERNALD, AMHERST, MASS.

In the preparation of my Catalogue of the Coccidæ I was not able to find where Illiger had proposed or described the genus *Lecanium*, although Burmeister in his Handbook of Entomology, Vol. II., p. 69 (1835), used this genus, giving Illiger as the authority. Burmeister described the genus and placed under it *hesperidum*, Linn., and several other species. My husband, Prof. C. H. Fernald, wrote to Mr. Theodore Pergande, inquiring if he could give me any information whether Illiger had really published this genus, and if so where it could be found. Mr. Pergande has sent the following letter in reply, and has consented to have it published :

"My dear Professor,—In accordance with my promise of December 9, 1901, regarding the authority for the genus *Lecanium*, I wrote to Dr. K. Mobius, Director of the Zoological Museum of Berlin, Germany, for information on this point, and received lately from Dr. Th. Kuhlitz, Assistant in the Museum, the following answer :

"In answer to your request, I inform you herewith that the generic name *Lecanium*, Illiger, in Burmeister's Handbook, Vol. II., was doubtless the first publication of this name ; a name which Illiger, prior to Burmeister's publication, had either written on some label or used in some manuscript which was never published.

"At any rate, I have failed to find anything in the literature pertaining to this genus, which would justify us to accept Illiger as the author.

"I wish to call your attention to the fact that Burmeister frequently credited the authorship for specimens to someone else, notwithstanding that the first publication of such species was made by himself.

"For instance, he credited the authorship of *Colobatristes macronatus*, Handbuch II., p. 325, which was described by him for the first time, not to himself, but to Klug. The label of the type in the Berlin Museum explains it fully. The label shows neither the name of Burmeister nor of Klug, as being the author, but simply "N," behind the name of the

species. "N" means simply, "Nomen in litteris," which Klug himself added to the specific name, to indicate that thus far this name was only used privately and did not yet exist in print. Burmeister adopted this name later for this species and described it for the first time, retaining the manuscript name and cited Klug as the author, though surely wrongly, of which Burmeister, as is universally acknowledged, is the author.

"As far as I have been able to see, the original label for the genus *Lecanium* has not been preserved in the Berlin Museum."

"In the hope that this communication will straighten the matter, I remain,

Most sincerely yours,

"THEO. PERGANDE."

Dr. O. G. Costa published his Nuove Osservazioni intorno alle Cocciniglie in the Atti del R. Institut. d'Incorrag., Vol. VI., pp. 31-52. This volume bears the date 1840 on the title page, but as Vol. V. is dated 1834, and as the separatum, which is exactly like the above-named paper except in pagination, bears the date 1835, it is quite certain that the first part of Vol. VI. was also published in 1835. Dr. Hagen was in error in giving 1828 as the date of this paper.

Costa in his Fauna del Regno di Napoli Emittenti divides the Coccidæ into three genera, as follows: Genus *Calypticus* with *hesperidum*, Linn., and *spumosus*, *lævis*, *aterrimus*, *radiatus*, *testudineus* and *fasciatus* of Costa. The first species, *hesperidum*, Linn., may be regarded as the type.

There is some doubt as to the exact date of publication of the Coccidæ in this work, but Hagen gives the date of the entire work 1832-1858. The Coccidæ of the Fauna is referred to in the Nuove Osservazioni, several times in such a way as to lead me to believe that it was published before 1835, and therefore *Lecanium*, which dates only from 1835, is preoccupied by *Calypticus*, Costa.

There is another work by Costa which I have not yet been able to see. This is his Prospetti di una nuova descrizione metodica del genera Coccus L., published in Naples in 1828. From a reference to this in the Fauna del Regno di Napoli, I infer that he proposed generic names which he changed in his later works. Whether these names were established in such a way that they may be used to the exclusion of the later ones, I have not yet been able to learn.

A RECENTLY DISCOVERED GENUS AND SPECIES OF
AQUATIC HYMENOPTERA.

BY J. CHESTER BRADLEY, PHILADELPHIA, PA.

In the Annales Soc. Ent. de France, LXIX., p. 171, P. Marchal publishes an article entitled "Sur un nouvel Hyménoptère aquatique, le *Limnodytes gerriphagus*, n. gen., n. sp."

Mr. Marchal is to be complimented on his discovery and observation of the habits of this very interesting insect, but it is deeply to be regretted that the generic name which he has chosen is preoccupied, hence it becomes necessary to change it, and desirable to do so at once, before it becomes widely known. The name *Limnodytes* was employed by Dumeril and Bibron in their "Erpétologie générale," Vol. VIII., 1841, p. 510, for a genus of salamanders, hence I propose in its place the term *TIPHODYTES*, nov. name.

In this connection I may apropos make a few remarks, gathered from Marchal's paper, concerning the habits and relations of this insect.

Metchnikoff, and after him Ganin, mentioned finding an unknown species of *Teleas* as a parasite on the eggs of *Gerris* (Hemiptera-Heteroptera). Marchal found the present species during the month of May, in the pond of Trivaux, Meudon, near Paris, also parasitizing the eggs of *Gerris*, but he considers it distinct, although closely related to the one found by Metchnikoff and Ganin. On the 12th of May he collected eggs which were animated with the larvæ of the parasite. These eggs were always arranged along the lower surface of Potamogeton leaves. The larvæ differed from those figured by Ganin in the arrangement of the hair and brevity of the caudal cornus. In June, four female and two male adults hatched, and these used their wings for swimming in any direction through the water, with a leisurely movement. When they came to the surface they had to make an effort to pass through it into the air, where they readily took flight. Likewise, in entering the water the insect bent its head forward and made a visible effort to conquer the resistance offered by the surface film, unless it entered on the edge of a projecting leaf or twig.

My excuse for entering at length here into an abstract and discussion of Marchal's article is because aquatic examples of the Hymenoptera are very few, and the fact that winged adults of such an order should enter and swim in the water must interest many entomologists who will never see the original article.

Amongst those already known may be mentioned *Agriotypus armatus*, Walker, which is confined (as are the others) to the European fauna, and has been observed swimming beneath the water, being parasitic on the larvæ of various Trichoptera. It forms a family of its own, probably related most closely to the Ichneumonidæ. *Polynema natans* belongs to the Mymarinae (Proctotrypidæ), and resembles in method of swimming Marchal's species, but its wings are somewhat abortive, and it is thought that it cannot fly well. It is parasitic on the eggs of *Calopteryx*. Lastly, *Prestirichia aquatica*, said to be a Chalcid, is parasitic on the eggs of Notonectus and Dytiscus, as observed by Lubbock and Enoch, and swims with its legs instead of its wings.

Marchal places his genus within the Proctotrypidæ, subfamily Scelioninae, close to the genus *Thoron*. For its characters I must refer the reader to the original memoir.

So far as I know, aquatic Hymenoptera are as yet unknown to the American fauna. But there should be—at least, it is quite likely that there may be—some species which has adopted an aquatic life here as well as in Europe. Who will be the first to find one?

TWO NEW SILPHIDÆ FROM COLORADO.

BY H. F. WICKHAM, IOWA CITY, IOWA.

Silpha Coloradensis, n. sp.—Form of *inaequalis*, but more elongate, black, except the tip of the abdomen, which is orange-rufous; above clothed with short black hairs. Head densely punctate, the punctures regular over the greater part of the surface, those in front of the inter-antennal line smaller and less distinct; occipital transverse impression deep; labrum short, broadly emarginate; antennæ black, club four-jointed, the last three joints pubescent, the terminal one longer, compressed, tip sinuately rounded. Thorax about one and one-half times as broad as long, narrowed anteriorly, sides broadly arcuate in front, more suddenly so behind, basal lobe slightly and very broadly emarginate. Surface somewhat irregular, densely and very regularly punctate, sides somewhat flattened. Scutellum slightly concave, densely punctured. Elytra as wide as the thorax and fully twice as long, the sides nearly parallel, outer margins distinctly reflexed, apices conjointly rounded, but sinuate externally, punctuation less dense than that of the thorax, each puncture with a recumbent hair. Disk flat, more suddenly declivous at sides than in *inaequalis*, each elytron with three costæ, the outer of which is much the best marked, being high, acute, not terminating opposite the

tuberosity, but suddenly bent inward at this point; the middle costa passes through the tuberosity, is almost obliterated except at tip, and very nearly reaches the apical margin; the inner costa distinct only near the tip, also nearly attaining the apex; tuberosity high. Body beneath shining, scabro-punctate, hairy, the hairs longer and paler on the metathorax sclerites, those on the last two abdominal segments and on the hind margin of the one preceding, orange. Length from anterior margin of thorax to apex of elytra, 11 mm.

The type is a male from the vicinity of the Argentine Pass, near Georgetown, Colorado, having been taken at an altitude of over 12,000 feet. The anterior tarsi are moderately broadly dilated, while the hind tibiae are straight and without hook at tip. It may possibly be a subspecies of *trituberculata*, to which it is evidently more closely allied than to any other species in our fauna.

Colon Liebecki, n. sp.—Oval, more pointed behind, moderately convex, brown, elytra and under surface paler, legs and base of antennae rufous; pubescence yellowish, not obscuring the surface colour. Head cribrately punctured, each puncture bearing a hair. Antennal club five-jointed, brownish, the last four joints very broad; scape rufous. Prothorax broadest a little in front of the base, narrowed to apex, sides arcuate, hind angles quite broadly rounded, surface finely punctured, pubescent. Elytra a trifle narrower than the thorax, broadest in front of the middle, gently narrowed behind, the sides slightly arcuate, punctuation about as on thorax, sutural stria entire but faint. Under surface of body moderately punctured, pubescent. Length, 1.8 mm.



FIG. 9.

In the male, the anterior tibiae are arcuate, the outline of the inner edge might almost be called sub-angulate (see figure 9), the front tarsi are moderately dilated, the middle and hind tibiae straight, the posterior femora with a small tooth near the middle; in the female the tarsi are not dilated, the tibiae straight and the hind femora without tooth.

Collected at Breckenridge, Colorado, in July. This species seems most closely related to *C. dentatum*, Lec., but is distinct by the male characters.

NOTE ON THE LARVÆ OF *PENTHINA HEBESANA*, WALK.

BY ARTHUR GIBSON, OTTAWA.

During the winter of 1900-1901 the larvæ of this pretty Grapholithid were rather abundant at Ottawa, hibernating in the heads of mullein (*Verbascum thapsus*). Full-grown specimens were collected by the writer and Mr. C. H. Young in April, which pupated in the office on and about the 25th April, the first moths appearing on the 11th May, and the last specimen emerging on the 22nd May.

These larvæ were found in the seed-pods, and had been feeding on the seeds; numbers were present in the same head. As far as the writer knows, this is the first record, at least in Canada, of the caterpillars feeding on mullein. Dr. Howard writes that Mr. Coquillett has reared the species from *Stachys palustris*, and Mr. Chittenden from a species of flag. He adds: "It evidently has several food-plants, and sometimes it does injury to plants after they have been pressed for the herbarium."

When mature the larva is 8.5 mm. in length, at rest; when extended, 10.5 mm. The head is 1.0 mm. wide, jet black, smaller than segment 2, rounded, flattened in front, furrowed at apex; clypeus high; setæ pale, darkened towards base, some of the hairs long and some short; mouth-parts brownish; antennæ pale, darkened towards tips, pale at tips. Cervical shield shiny, not so black as head, anterior portion slightly reddish, the whole divided by a pale line. Body plump, cylindrical, dull copper colour, with a faint dark dorsal stripe. Skin finely pitted. Spiracles inconspicuous, ringed with black. Each segment has one distinct crease. Tubercles rather faint, same colour as body, setæ pale; hair from tubercle i. short, from ii. long; tubercle i. anterior to ii., iii. in a line with ii. Anal plate blackish. Thoracic feet shiny jet black; prolegs concolorous with body.

On the 24th March, 1902, two larvæ were found in the seed-pods of the above plant, but neither of these showed any trace of a dorsal stripe, and their colour was more of a dull red, not so bright as those from which the above description was taken. These two specimens were inside a thin cocoon of white silk, where they were doubtless awaiting the return of warm weather before pupating. More larvæ were collected early in May, one of which was of a dull greenish shade, with the faint dark dorsal stripe, hardly traceable on some segments.

I am indebted, through Dr. Fletcher, to Dr. Dyar for the determination of this species.

SOME GALL-INSECTS.

BY T. D. A. COCKERELL, EAST LAS VEGAS, N. M.

Cynipide.

Holcaspis Arizonica, n. sp.—Gall globular, 9 mm. diam., pale ochreous, not shiny, attached to the base of the petiole of a leaf of *Quercus Arizonica*, Sargent. There is a projecting point next to the place of insertion. Within, the gall is brown, fibrous, moderately dense, at least dithalamous.

Fly emerging April 19, two females. Body $3\frac{1}{2}$ mm. long, wings $3\frac{3}{4}$ mm.; antennæ 2 mm., 15-jointed, joint 3 considerably the longest. Length of joints in μ : (3.) 360, (4.) 240, (5.) 200, (15.) 170. The joints, especially the apical ones, with fine longitudinal ridges, between which are rows of minute punctures. Head ferruginous; thorax and abdomen piceous; margins of mesothorax, and two spots on scutellum, dull ferruginous; legs bright ferruginous; anterior tibiæ with an apical projection; anterior tibial spurs bent; claws of all the legs falciform, with a large triangular basal tooth. Outer parapsidal grooves failing anteriorly. Scutellum a large rounded hairy eminence, without grooves. Sides of thorax, and abdomen except upper basal portion, with much glittering white hair. Abdomen with a short ferruginous hairy projection beneath; ovipositor not visible. Naked portion of abdomen smooth and polished, hairy portion minutely tessellate, with a tendency to oblique grooves, only visible with a compound microscope. Wings strongly clouded on apical half, nervures piceous, areolet present.

Hab.—Prescott, Arizona, 1902. Collected by the writer. Closely related to *Cynips sulcatus*, Ashmead, but differs by its much darker colour and infuscated wings. It seems to go best in *Holcaspis*.

Cecidomyiide.

Lasioptera carbonitens, n. sp.—Gall shaped something like a long onion bulb, consisting of an aborted shoot of a grass not identified. The gall is entirely similar to that on *Brachypodium silvaticum*, figured by Rübsaamen in *Ent. Nach.*, XXI. (1895), p. 16. Fly emerged April 21.

♀. Shining coal-black; red patches at bases of wings; bases of all the femora, but especially the hind ones, pallid with a reddish tint; halteres pale reddish, shining; head small; antennæ short, 2 + 16 jointed; abdomen wholly without spots; ovipositor retractile; wings hyaline, iridescent, with black hairs and heavily-scaled black margins; closed wings reaching about to end of abdomen. Length a little over 2 mm., wings $1\frac{1}{2}$ mm.

Hab.—Las Valles, N. M., near the Gallinas River, 1902.

Lasioptera ephedricola, n. sp.—Gall a resinous elongate lateral brown swelling of a twig of *Ephedra trifurca*. Flies emerge second week of March.

♂. Similar to *L. ephedrae*, but abdomen with basal and apical white bands on the fifth segment, but otherwise hardly banded. Legs dark brown. Costa without a white spot. ♀. Costa black, with a white mark; thorax with three black vittæ joined in front; abdomen with ten white spots. Antennæ: ♂, 2 + 18 jointed; ♀, 2 + 20 jointed.

The anchor-process of the larva resembles that figured by Rübsaamen, in Bull. Soc. Nat., Moscow, 1895, Plate XVI, Fig. 25, but it differs in detail, being broader and shorter, with the two processes of the head only about half as long, and at least twice as far apart. The sides of the head are also much more bulging. (The anchor-process of *Lasioptera Willistoni* differs from both of these in having a large quadrate elevation between the processes.)

Hab.—Mesilla Park, N. M., 1900.

Cecidomyia, n. sp.—Galls on *Lycium Torreyi*. ♀. Eyes united on vertex; antennæ 2 + 15 jointed; head and thoracic dorsum very dark brown, abdomen mostly crimson; legs and antennæ very dark brown. Mesilla Park, N. M.

Cecidomyia, n. sp.—In dry stems of *Amarantus Palmeri*, not forming a distinct gall. Larva orange; anchor-process with the head terminating in two large sharp teeth, and the sides of the head produced into long sharp teeth. Adult unknown. Mesilla Park, N. M.

BOOK NOTICE.

FOSSILE SCHMETTERLINGE UND DER SCHMETTERLINGSFLUGEL, by A. Radcliffe Grote. Verhändl. der K. K. Zool.-bot. Gesellschaft in Wien, Heft 9, Jahrgang, 1901. With figure in text.

The author alludes to a general difficulty in tracing descent, arising out of the movements of animals. The butterflies had a special cause for such shifting of territory at the time of the glacial epochs; as previously shown by the author before the Am. Ass. Adv. Sci. in 1875, the effect of these migrations may be traced in the geographical distribution of *Eneis semidea* at the present time. Not only the obscurity of the fossil remains of Lepidoptera, but a want of detailed knowledge of the neuration itself, made the earlier determinations uncertain; the wings are often the best preserved portions of fossil specimens and thus the importance of their close study becomes obvious. The author recapitulates his

principal results in the specialization of the lepidopterous wing (1896-1900) and claims that by applying these tests in connection with the zoological principle of convergence (previously very generally neglected by writers on the Lepidoptera) he has been able to give a clearer picture of the development of the butterflies and a firmer, more natural classification than any offered by others. The preface to the new Palearctic Catalogue, by Staudinger and Rebel, recognizes this fact, saying that "for the retention of the Papilionids at the beginning of the Rhopalocera, and for the arrangement of this group altogether, Grote's recent phylogenetic studies are authoritative" (l. c., p. X.). By showing from his wing studies, a parallelism in development of the two main lines he separates in the butterflies, the author believes he has terminated the controversy as to whether the Papilionids or Nymphalids are "highest." In demonstrating that the *Papilionides* are a closed, the *Hesperiaes* an open, group to the moths, the sequences adopted among others by Hübner, H.-S., Meyrick, Hampson, Scudder, Reuter and the Philadelphia List* are invalidated. We were, indeed, "familiar," as recently stated in print, with the commencement by *Papilio* in catalogues, as well as in works of Linné, Fabricius, Boisduval, W. H. Edwards, etc., but we were *not* previously "familiar" with its proper reason, which it is the aim of science to expose. It will be more correct, however, in future to inaugurate the Papilionid series with *Parnassius*, this showing the most specialized structure. The Papilionid forms which mimic Nymphalids, and they are many, are younger than the forms they copy.

The author has shown that in the Pieri-Nymphalid stem, the Pierids are the ascending and neurationally more advanced group, while in the Lycæni-Hesperids, belonging to the same main line, the Blues take up the corresponding position. A synthetic type has been detected by the author in *Nemeobius*, proving the identity of the line itself. In the first main line, that of the Papilionides, the Parnassians are the more advanced and presumably the more modern group, while *Ornithoptera*, contrary to received opinion, has proved to be the more generalized form (cf. Proc. Am. Phil. Soc., Oct., 1899). The present paper under review elucidates some discrepancies in nomenclature between the new Catalogue and the final results of the author on the classification of the butterflies as

*"Dr. Skinner has placed the Nymphalidae at the head of the Rhopalocera, and, in my opinion, correctly so."—Ed. Phil. Check List. The list commences with the Limnads, which are generalized forms, of which fact neither Dr. Skinner or the editor seem to have been aware.

given in the second part of the Syst. Lep. Hild., published April 19, 1900. It is probable that but for these publications the new Catalogue would have begun with the Nymphalidæ.

A discussion of the homology of the second radial branch in the Pierids with reduced radius follows the author's expressed preference for the amended Redtenbacher-Comstock system of notation for the veins. According to Spuler, the second radial branch in *Pieris* should be notated $2+3$, but a fusion of these branches is not demonstrated in the pupal wing. Grote's theory of the movement of the radial branches is, that they pass off by the tip of the wing. This is true especially for 2 to 5. Now, in *Pieris* the second radial remains in its original generalized position, near R_1 , above the cell. It does not seem probable that R_3 could ever move backwards to fuse with R_2 . The reduced radius of *Pieris* receives compensatory mechanical support through the advance here of the first median branch from below. In the Nymphalids, where the radius is never reduced and remains in a generalized five-branched condition, the upward movement of the median branches is stayed.

The paper closes with a brief summary of the fossil remains of Lepidoptera published. These remains, though too few to be decisive, favour the author's view, as to the butterflies, that the Nymphalids and Hesperians represent older groups of the line to which they belong. The nearer relation between the two has been made evident by the author's discovery of the "long fork" in *Charaxes* (c. f. Proc. Am. Phil. Soc., 1898, 39), which indicates the way in which a wing of the Hesperid type may have passed into one of the type of wing shown by the brush-footed butterflies. A resemblance is shown also in the generalized radius and the consequent unwillingness of the median branches to leave the cross-vein. All these observations tend to support a mechanical source for the changes in the neurulation.

The author considers the Lepidoptera to be a relatively younger branch of the insects. The possible conclusion to be drawn from their fossil remains is, that from Tineid-like forms existing in the middle period of the earth's history there was a rapid development in the Tertiaries, where we meet with butterflies already quite like the Nymphalids and Skippers of the present day. The meagreness of the material precludes the formation of any final opinion.—*Communicated*.

Mailed July 2nd, 1902.

